A Preliminary Proposed Freight Rail Emission Reduction Strategy

July 31, 2007

Investment Package Strategic Principles

- Combine related rail investments into one package
- Package must include both mobility and air quality projects
- All stakeholder groups must benefit from and contribute to the investment package

Two Investment Packages Options

A. Rail Expansion + Grade Separations + Electrification

B. Rail Expansion + Grade Separations + Engine Upgrades to Tier 4

Grade Separation Investments

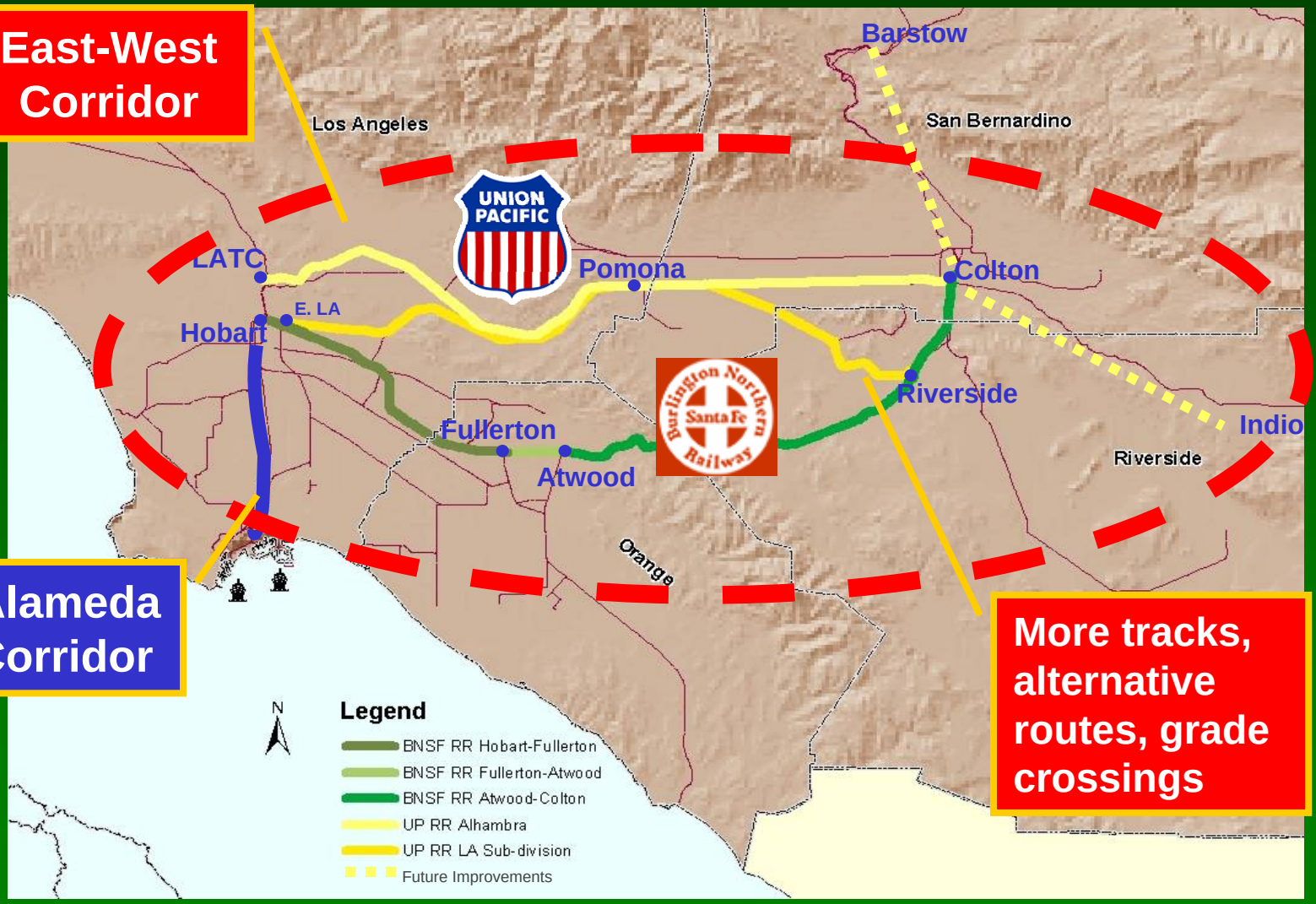
- **The total cost of regional grade separation needs is $4.6 billion**
- **The projects are consistent with county commission submittals and the Multi-County Goods Movement Action Plan**
- **Almost $800 million have been committed locally to these projects**

Investment Package

	Current (07) $ Billions	
Congestion Reduction		
• Rail Capacity Additions	$ 2.29	$ 6.89
• Grade Separations	$ 4.60	
Alternative Power*		
• Phase I Electrification	$ 3.40	$ 6.43
• Phase II Electrification	$ 2.50	
• Phase III Electrification	$ 0.53	
Cleaner Engines		
• Acceleration of locomotive upgrade by railroads	$ 2.05	$ 2.05

Note:*Preliminary capital cost estimates (escalating 1992 study results to current dollars); operating costs not included.

Rail Expansion & Improvements

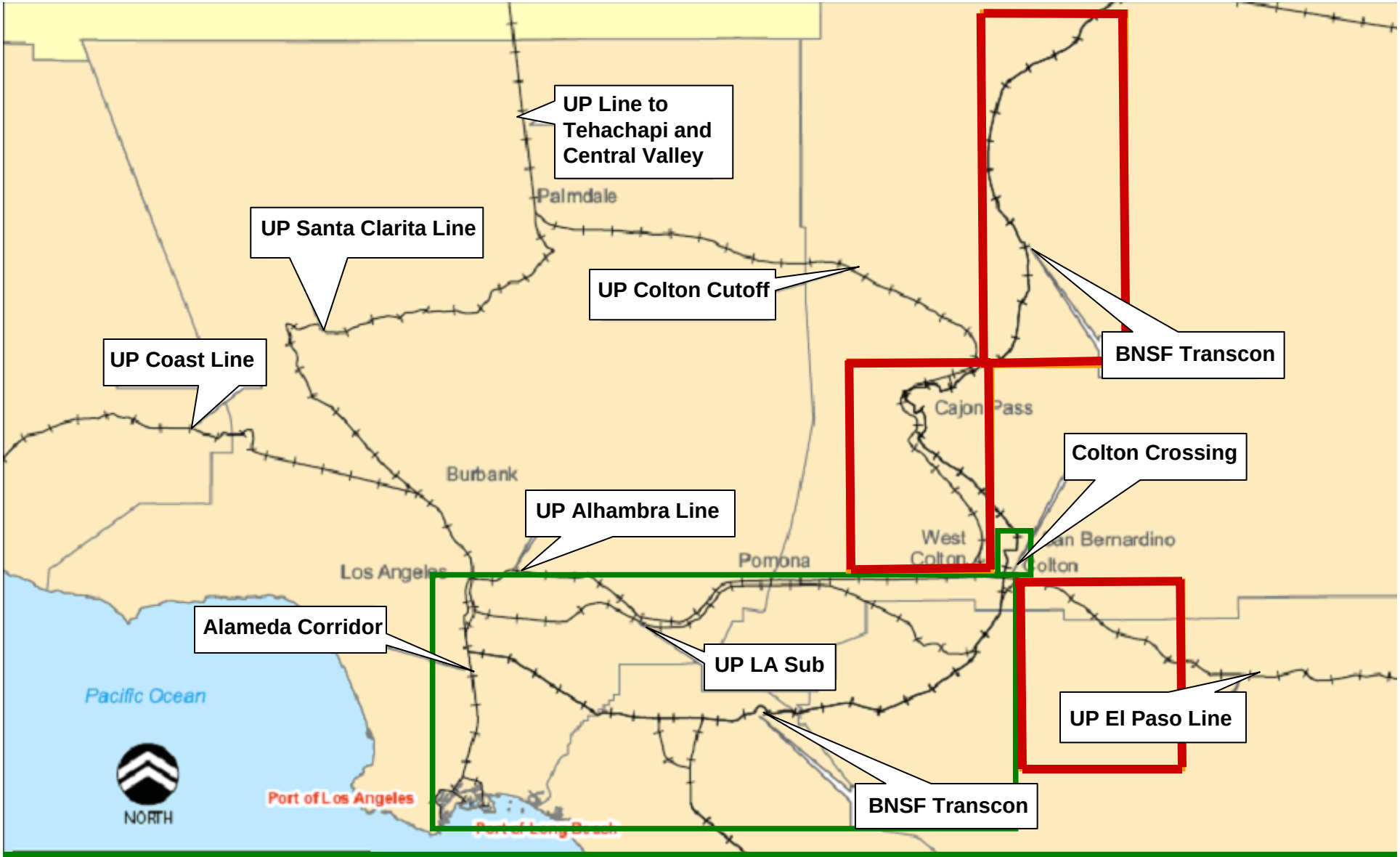


Rail Electrification

#1

Primary East/West Freight Line Electrification

Miles	Locomotives	Cost
250	360	$3.4B



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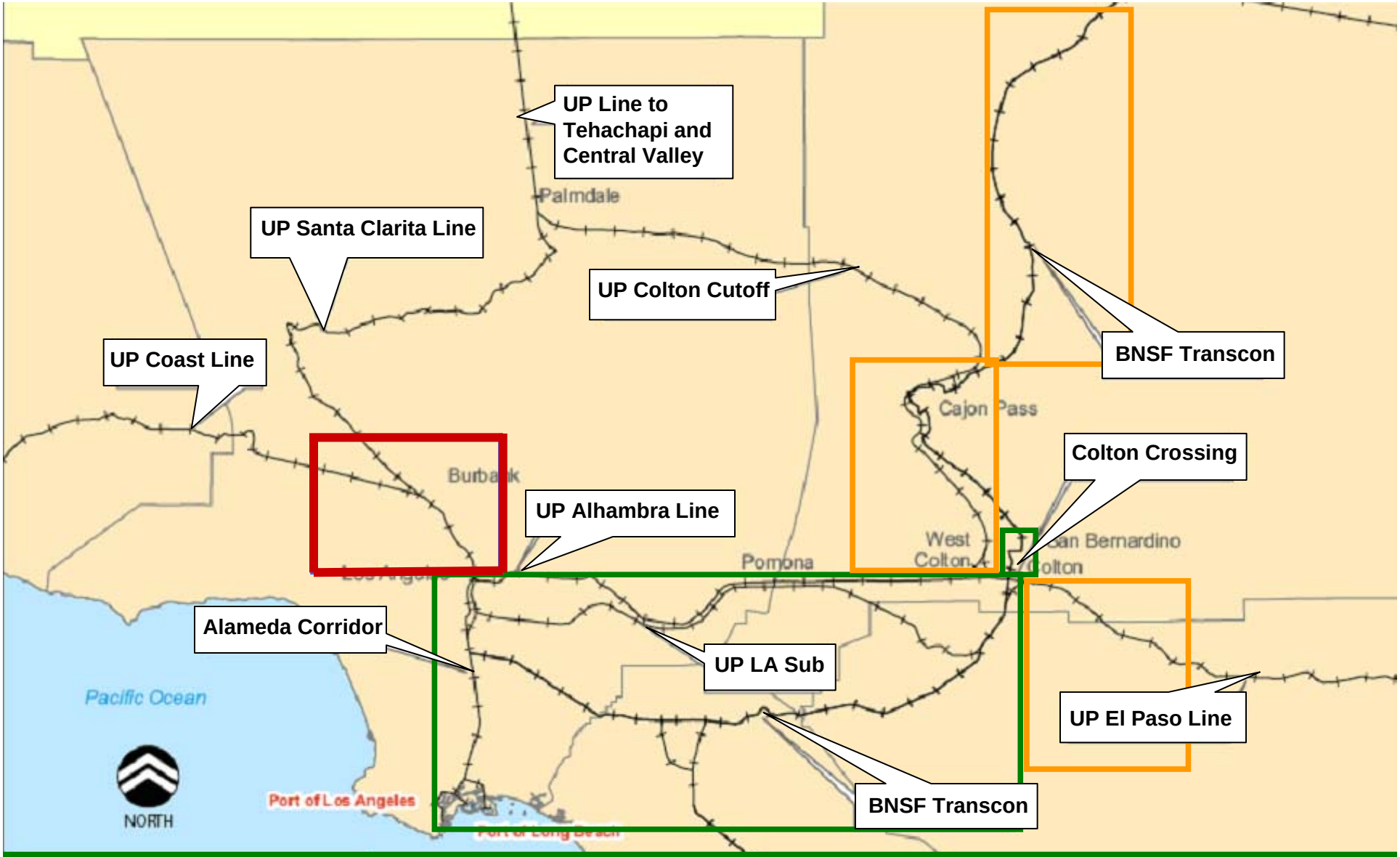
Electrification Extension to Barstow and Indio

Miles	Locomotives	Cost
170	360	$2.5B



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Electrification Extension to Chatsworth and San Fernando

Miles	Locomotives	Cost
40	55	$0.53B

Engine Upgrade to Tier 4

Proposed EPA Exhaust Emissions Standards

1. Tightening Emission Standards for Existing Locomotives When They Are Remanufactured

2. Set Engine-Out Emission Standards for Tier-3 Locomotives to Phase in Starting 2009

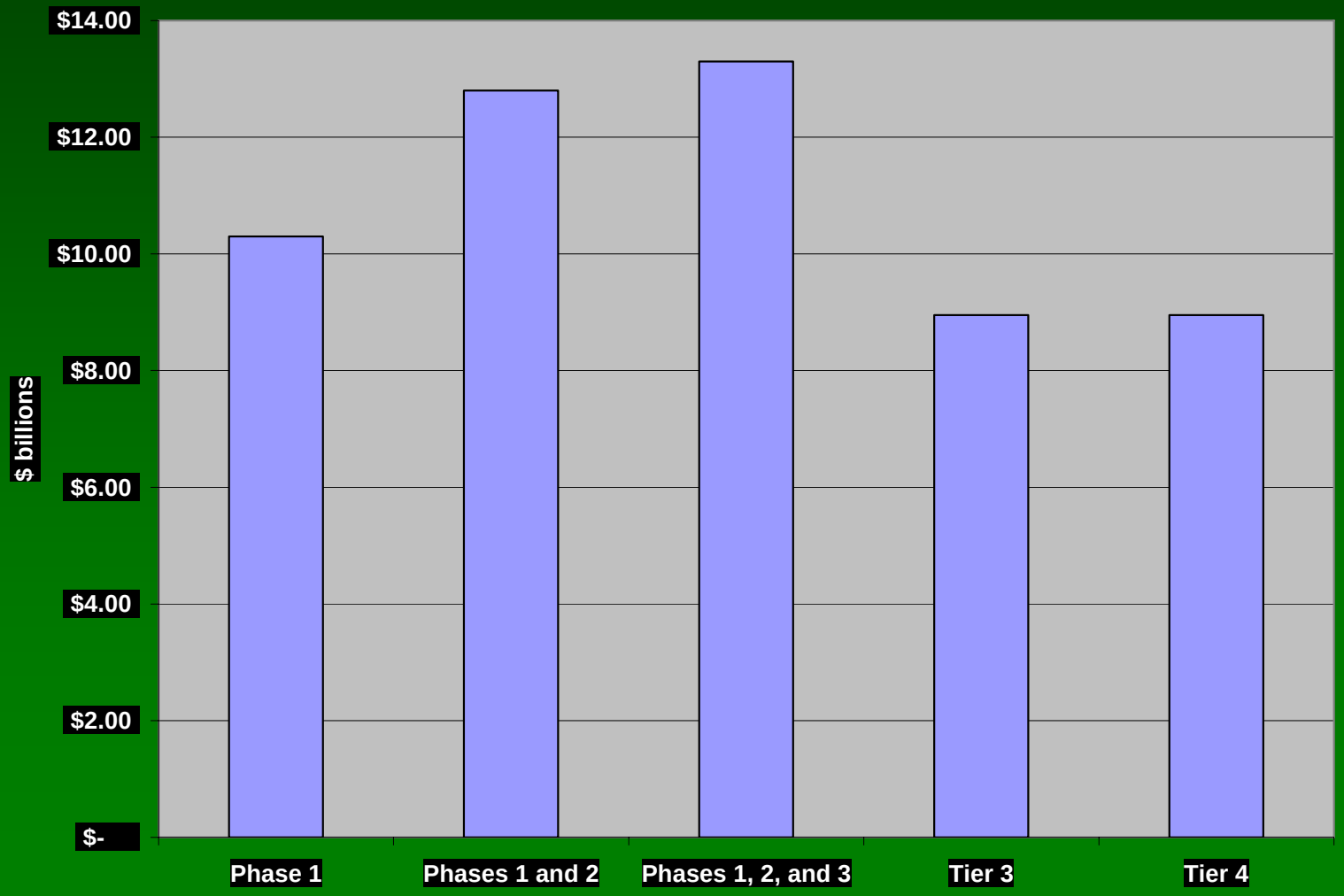
3. Set Engine-Out Emission Standards for Tier-4 Locomotives to Phase in Starting 2014

Potential Locomotive Upgrade Strategies

- Accelerate to Tier-3 upgrades by providing an incentive to the railroads.
  - This could start quickly and be completed by 2014
  - NOx reductions are significantly lower than in electrification.
- Accelerate to Tier-4 upgrades by providing an incentive to the railroads.
  - Right now, this can only start in 2014
  - It may be possible to also provide incentives to the manufacturers to accelerate the development and production of these engines
  - Either way, this strategy can be accomplished by 2020. NOx and PM reductions are similar to the 3 electrification scenarios combined.
- Either option would cost about $2.05 billion

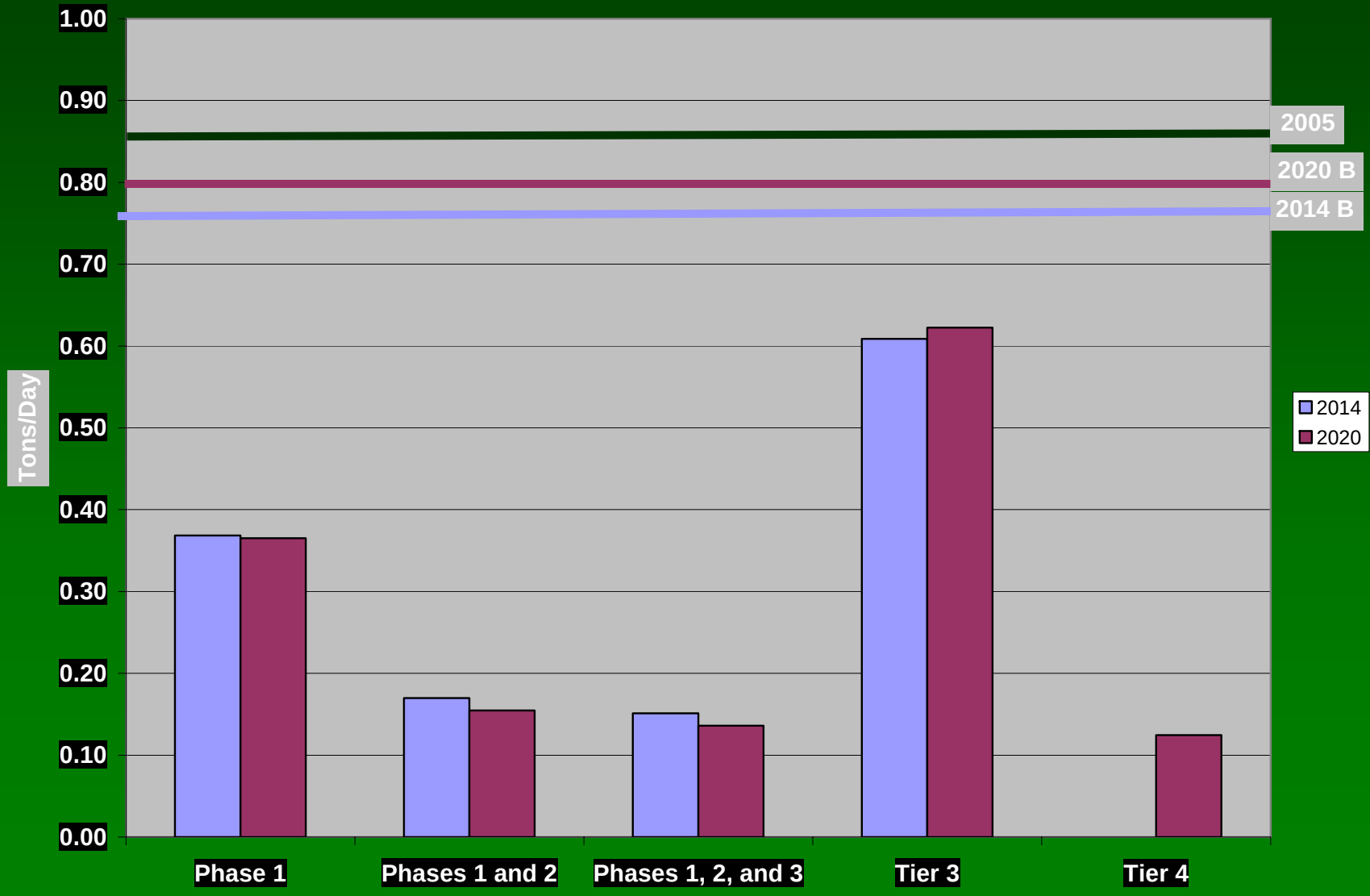
Scenario Comparisons

Scenario Cost Comparisons (in constant $2007)



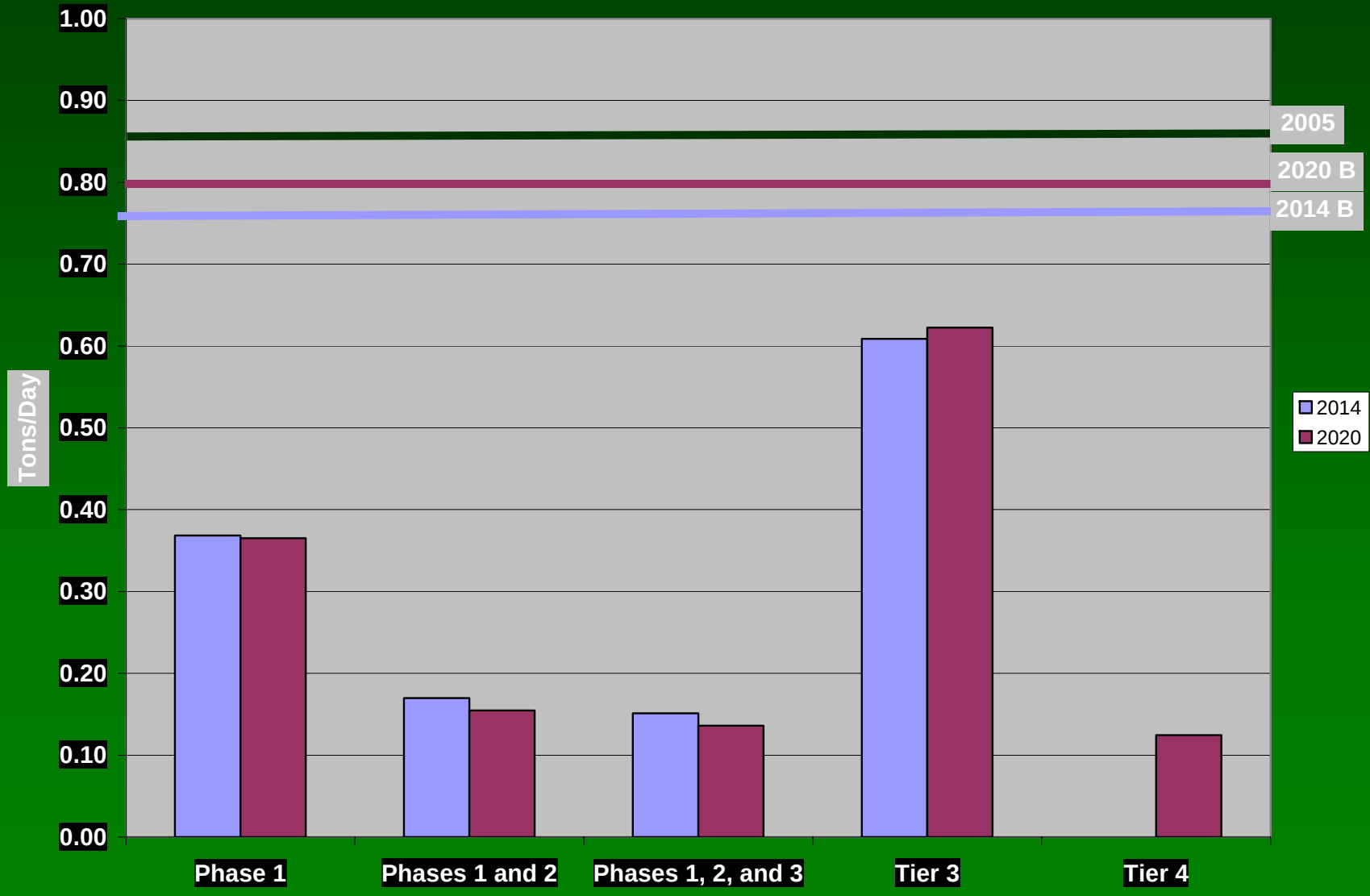
NOx Emission Reduction Estimates

(all scenarios include grade separations and rail expansion)



PM 2.5 Emission Reduction Estimates

(all scenarios include grade separations and rail expansion)



Cost Effectiveness

		($/ton) NOx	PM
2014	Electrification (Phase 1, 2, & 3)	$55,057	$1,446,837
	Engine Upgrade to Tier 3	$130,743	$783,097
	Engine Upgrade to Tier 4	--	--

		($/ton) NOx	PM
2020	Electrification (Phase 1, 2, & 3)	$47,012	$1,370,066
	Engine Upgrade to Tier 3	$115,214	$733,438
	Engine Upgrade to Tier 4	$11,737	$322,851

Advantages and Disadvantages/Risks of Electrification

- **Advantages**
  - Technology exists and has been deployed before
  - Possible implementation by 2014
  - Helps meet attainment goals in 2014 and beyond (e.g., 2023 Ozone attainment)

- **Disadvantages/Risks**
  - Expense (over $6 billion), could be higher given recent cost escalations
  - Disruptive to railroad operations, likely opposition
  - Unlikely to gain partial funding from railroads
  - Implementation by 2014 extremely challenging (funding, institutional, railroads, construction, right-of-way)

Advantages and Disadvantages/Risks of Accelerated Locomotive Engine Upgrades

- **Advantages**
  - Cost is lower than electrification ($2 billion vs. $6 billion)
  - Railroads will eventually upgrade locomotives, likely to accelerate upgrades with proper incentives
  - Potential for partial funding by railroads
  - Similar NOx and PM reductions by 2020

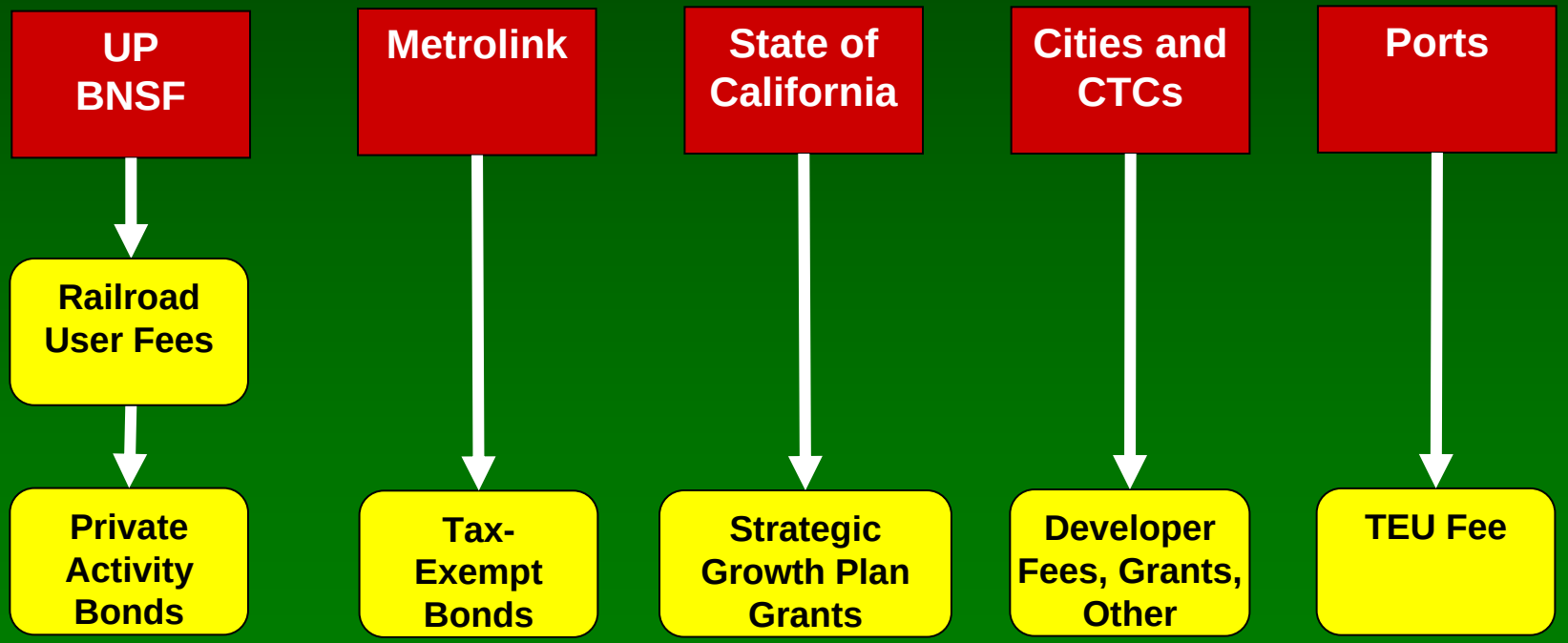
- **Disadvantages/Risks**
  - Tier 4 Technology does not exist yet for 2014 implementation
  - Does not help the region meet the 2014 attainment goals
  - Does not help as much with Ozone 2023 attainment goals

Possible Funding Framework

Benefits by Stakeholder Group

- **Railroads – lower expansion costs (due to lower cost of borrowing, contributions from other stakeholders), corporate citizenship**
- **Metrolink – increased capacity to continue and expand service**
- **Cities and CTCs – mobility and safety benefits from grade separations**
- **Ports – facilitating aggressive on-dock expansion**
- **State – contribution to State leadership in goods movement**
- **ALL – REDUCED AIR POLLUTION AND IMPROVED MOBILITY**

Proposed PPP Cost Allocation



Next Steps

- Detailed funding analysis (considering debt service, stakeholder shares)
- Policy guidance (remember August 2nd workshop)
- Consensus building
- Legislation (for TEU fee)
- Institutional
- Implementation